PREVALENCE OF MALOCCLUSION IN A SAMPLE OF JORDANIAN FEMALES

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ABSTRACT

The aim of the study was to determine the frequency of different types of malocclusion in a sample of young adult Jordanian females. A sample of 827 females aged 18 years ± 6 months, who presented to officer election committee for Mu'uta University (Princess Muna College for Nursing and Allied Medical Health Professions) from different provinces of Jordan were examined for malocclusion. British Incisor Classification and Angle's classification were used to determine incisor and molar relationships.

Class I was the most prevalent type of malocclusion and was found in 71% of the subjects surveyed. This was followed by class II division 1 which represented in 11.4%. Class II division 2 was the least common and was seen in only 6.7%. Whereas, frequency of class III malocclusion was 11% of the study sample. Pearson Chi-Square test revealed no significant statistical differences in frequencies of different types of malocclusion in different provinces of Jordan ($p>0.05$). Prevalence of molar class I, II and III relationships were 74.7%, 15.1%, and 10.2% respectively.

Frequency of class I malocclusion in young adult Jordanian females was the highest followed by class II division 1 and class III. Class II division 2 had the lowest frequency. This agreed with other studies conducted in Jordan but yet with differences in prevalence. Angle's class I molar was most prevalent followed by class II and class III.

Key Words: Malocclusion, Jordanian, British Incisor Classification, Angle's classification.

INTRODUCTION

Malocclusion is an improper occlusion which may be considered aesthetically unsatisfactory. It is usually described as incorrect relation between the teeth of the upper and lower dental arches or misalignment of the teeth.[1]

Different methods have been used to evaluate, and classify malocclusion which can be recorded either qualitatively or quantitatively. Classification of malocclusion is important for describing and recording occlusion. It is also useful in estimating the prevalence of malocclusion in a population.[2] Both Angle's classification and the British Incisor Classification System give a qualitative description of malocclusion.[3]

Angle's classification has been extensively used as an epidemiological tool for assessment of malocclusion.[4]

This classification describes the anterioposterior molar relationship. However, this method has its limitations since many aspects of malocclusion such as transverse and vertical malrelationships are not included. Furthermore, there have been problems in classification cases with mesial drift or loss of the first permanent molars.[5]

Incisor Classification System, on the other hand describes the incisor relationship. It records the position where the lower incisal edges occlude in relation to the cingulum plateau of the upper incisors. It also takes into consideration the increase or decrease in the overjet due to protrusion or retraction of upper central incisors giving two subdivisions to class II incisor relationship. This method has been used widely in malocclusion prevalence studies since it is an easy method, but it doesn't take the molar relationship into consideration.[3]

Since malocclusion is considered one of the most widespread oral health problems occurring in the majority of the population and in accordance with the World Health Organization, it should be subjected to periodic

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epidemiological surveys.[1] Knowledge of a population's epidemiological situation contributes to understanding the causes, and then planning and providing prevention and treatment services.[6] It is also necessary to perform these epidemiological studies in boys as well as in girls at various stages of dental development and from different geographic areas.[7]

In Jordan the total number of citizens consists of about 6, 198,677 (July 2008 est.) with 3250501 males and 2948176 females.[8] Administratively, Jordan is divided into provinces called governorates.

The aim of this study was to assess the frequency and prevalence of malocclusion in different provinces of Jordan in a sample of 827 Jordanian females aged 18 years ± 6 months. No other study was ever carried out to assess frequency of malocclusion in different provinces of Jordan and with this sample size.

METHODOLOGY

About 957 Jordanian young adult females, aged 18 years ± 6 months, who had just finished high school and presented to officer election committee for Mu'ta University (Princess Muna College for Nursing and Allied Medical Health Professions) from all over Jordan, were examined for the presence of malocclusion. Ethical approval was obtained from the human research ethics committee of the directorate of Jordanian Royal Medical Services.

Subjects recruited for the study were selected according to the following inclusion criteria:

- No history of any serious medical problems
- No history of trauma or surgery that might have affected their occlusion
- No previous history of orthodontic treatment
- All permanent teeth excluding third molars should be present.

Consequently, 827 subjects satisfied the inclusion criteria. All subjects were examined by one dentist under natural lighting. A tongue depressor was used to retract cheeks to get a good view of dentition on each side. An individual chart was prepared for each subject to record the personal information, medical history, previous dental history and classification of occlusion. Subjects were asked to close their teeth in centric occlusion position. The incisor relationship was classified according to the British Standard Institute (1983).[9] On the other hand, Angle's classification was used to classify molar relationships.[10]

The data were fed into a computer. The statistical analyses were performed using the SPSS software package (SPSS for Windows, version 16.0). The frequencies of different types of malocclusion for each province were calculated. The total frequency of each type of malocclusion was also calculated. Frequencies were then compared by using Pearson Chi-Square test for crosstabulation.

RESULTS

The most common type of incisor malocclusion in Jordanian females was class I which was found in 71% of the subjects. This was followed by incisor class II division 1 and it was present in 11.4% of the study sample. Class II division 2 was the least common malocclusion in Jordan presented in only 6.7%. The frequency of class III malocclusion was 11%. This is demonstrated in Figure 1.

The frequency of each type of malocclusion in this Jordanian female sample in different provinces of Jordan is displayed in Table 1. Zarka had the highest frequency of class I malocclusion (78.6%) and the lowest frequency of class II division 1 (8.6%). Ajloun showed the highest frequency of both class II division 2 and class III (9.6% and 19.2% respectively), and the lowest frequency of class I. Balka on the other hand, showed the lowest frequency of class III (5.4%). It was also noticed that Aqaba though showed the highest prevalence of class II division 1 (17.3%), it had also the lowest prevalence of class II division 2 (1.9%).

The statistical analysis showed no significant differences in frequencies of different types of malocclusion in different provinces of Jordan ($p > 0.05$).

As for Angle's molar classification, the prevalence of class I was 74.7% and varied between 70.1% in

TABLE 1: PREVALENCE OF INCISOR MALOCCLUSION IN A SAMPLE OF JORDANIAN FEMALES

Province	Malocclusion				Total
	Class I	Class II div 1	Class II div 2	Class III	
Amman	71.3%	13.9%	6.9%	7.9%	100%
Balka	77.5%	12.6%	4.5%	5.4%	100%
Zarka	78.6%	8.6%	4.3%	8.6%	100%
Aqaba	71.2%	17.3%	1.9%	9.6%	100%
Karak	75.9%	9.8%	4.5%	9.8%	100%
Irbid	68.2%	10.5%	8.7%	12.6%	100%
Ajloun	60.6%	10.6%	9.6%	19.2%	100%
Total	71.0%	11.4%	6.7%	11.0%	100%

TABLE 2: ANGLE'S CLASSIFICATION IN DIFFERENT PROVINCES OF JORDAN

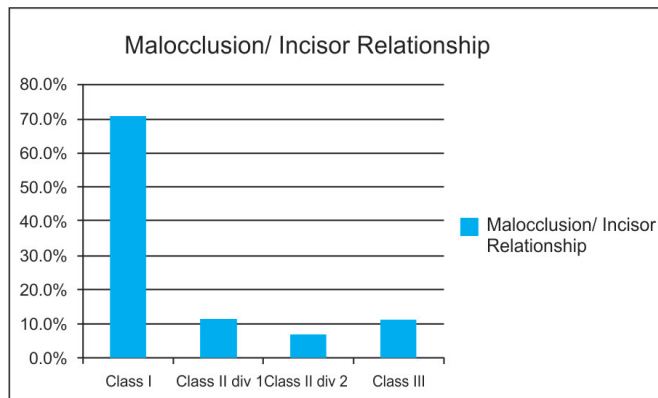| Province	Molar Malocclusion/ Angle's Classification			
	Class I	Class II	Class III	Total
Amman	72.6%	10.4%	17%	100%
Balka	75.6%	15.0%	9%	100%
Zarka	77.3%	14.9%	7.7%	100%
Aqaba	70.1%	20.8%	9.0%	100%
Karak	72.7%	16.9%	10.5%	100%
Irbid	73.8%	15.2%	11.0%	100%
Ajloun	78.6%	12.2%	9.2%	100%
Total	74.7%	15.1%	10.2%	100%

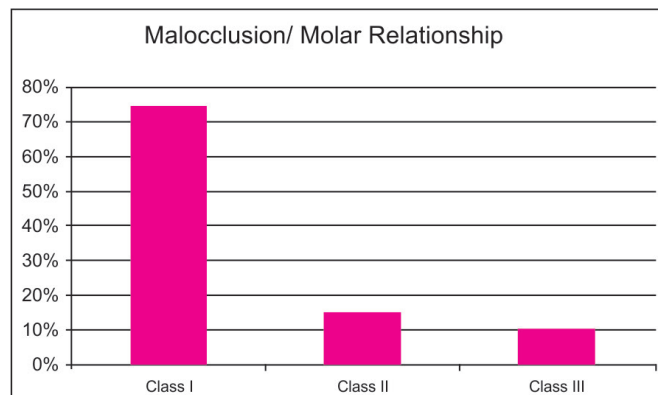Fig 1: The total frequency of incisor malocclusion in a sample of Jordanian females

Fig 2: Angle's Classification in a sample of Jordanian females

Aqaba and 78.6% in Ajloun. Class II was detected in 15.1%, varied between 10.4% in Amman and 20.8% in Aqaba. Class III malocclusion was the least prevalent with 10.2% and varied between 17% in Amman and 9% in Aqaba. It was noticed that the highest frequency of molar class III and the lowest frequency of class II malocclusion ware present in Amman. On the contrary, Aqaba showed the highest prevalence of class II and the lowest prevalence of class III malocclusion. This is presented in Table 2 and Figure 2.

DISCUSSION

Many studies have been published that described the prevalence and types of malocclusion. Nonetheless, comparison between the results was difficult because of the differences in the age and size of the study sample and the methods used to record occlusal relationship. The determination of the total frequency of malocclusion was considered one of the simplest methods of recording malocclusion[11], and this was the method that we have used in our study.

Moreover, most of the malocclusion prevalence studies have been carried out on children in either the mixed or permanent dentition stage. Fewer studies determined malocclusion distribution for the adults.[12] In view of the fact that malocclusion is a manifestation of morphological variation related to development of dentition rather than to chronological age,[11] then most malocclusions may change with time depending on growth pattern and environmental factors. Hence, prevalence of malocclusion might also increase or decrease with time. So in our study the subjects were adults, thus reliable assessment of occlusion was made on permanent teeth only, and occlusion was studied after completion of craniofacial growth and development.[13]

Very few studies had been conducted in Jordan. Hamdan A. et al (2001)[14] studied the prevalence of malocclusion in 16 year old Jordanian school children. They found class I incisors were most prevalent (40.3%), followed by class II division 1 (26.3%) and class III (25%). The least prevalent malocclusion was class II division 2 (8.4%). The findings of our results confirmed that most prevalent malocclusion was class I, followed by class II division 1 and class III while the least prevalent malocclusion was class II division 2. Though, in our study the prevalence of class I was higher, in contrary to class II division 1 and 2 and class III prevalence which were lower.

Yet again, Al-Ibrahim H et al (2010)[15] studied the frequency of malocclusion in an orthodontically re-

ferred Jordanian population. They stated that class I malocclusion was recorded in 48% of the sample, class II division I in 30% of the sample whereas, Angle class III was recorded in 13%.

In addition, in north Jordan, the most prevalent malocclusion was class I incisors which presented 55.8% and class I molar which was 55.3%. Class II and III incisors were 33.7% and 10.5% respectively, while prevalence of class II and III molars were 18.8% and 1.4% respectively of the 13-15 year-old North Jordanian school children sample, as published by Abu Alhaija et al (2005).[16] Irbid, in our study showed 73.8% prevalence of class I, whereas 15.2% and 11% for class II and III molars respectively. As for class I, class II division 1 and 2 and class III incisors, prevalence was 68.2%, 19.2% and 12.6% respectively.

A similar study[17] was carried out by authors to determine prevalence of malocclusion in a sample of 4777 Jordanian males aged 18 years ± 6 months, who also presented to officer election committee for Mu'uta University, from different provinces of Jordan were examined using Angle's classification. Normal occlusion was found in 40% of the subjects. Prevalence of class I, class II division 1 and division II, and class III were 31.8%, 21%, 5.8% and 1.4% respectively.

As for the neighboring countries, the results of a Turkish study[4] conducted on an adolescent sample showed that 34.9% of the subjects had had class I malocclusions, 40% had class II division 1 malocclusion, 10.3% had class III malocclusions, and finally 4.7% had class II division 2 malocclusions.

In another Turkish study,[18] class I malocclusion was found in 64% of the study sample. The frequency of class II, division 1 and class II, division 2 malocclusions were 19% and 5%, respectively. Class III malocclusion was present in 12% of the patients. These results were close to ours.

Class I malocclusion in Lebanese orthodontic patients[7] was 20.98% of the total sample. Class II malocclusion (division 1 and 2) was diagnosed in 49% and Class III malocclusion represented 7.32%.

The most frequent type of Angle's classification for malocclusion in a sample of Saudi females seeking orthodontic treatment[12] in 2010 was class I which was found in 73.9% of the cases followed by class III (13.3%) and class II (12.7%). Unlike what was found in this study where class II was more prevalent than class III.

Soha et al (2005)[19] studied the occlusal status in Asian male adults. The distribution of incisor relationships were 48.1% for class I, 26.3% for class II division 1, 3.2% for class II division 2 and 22.4% for class III. As for right Angle's molar relationships the frequencies were 49.9%, 24.5%, and 24.2% while left Angle's molar relationships were 53.1%, 25.1%, and 21.2% for Class I, II, and III, respectively.

The variation in the prevalence of different types of malocclusion in different provinces of Jordan, though not significant, could be due to hereditary and environmental factors. Furthermore, awareness of the importance of preventive and interceptive orthodontics could be considered a contributing factor as well.

CONCLUSION

The results of our study showed that incisors and molars class I malocclusion were the most prevalent

occlusal pattern (71% and 74.7%) among this young adult Jordanian female sample. Class III incisors and molars were found in 11% and 10.2%. Molar class II prevalence was 15.1%, whereas, incisor class II division 1 and 2 were 11.4% and 6.7% respectively. This however, might not be representative of the whole female population and needs to be confirmed with further randomized studies and from different age groups.

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